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The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRIAN PETER ARNESS,
GRAHAM DAVID SHERLOCK,
JOSEPH LEONARD MOROSO,
STEWART WILLIAM BEITZ,
and GRAYDON WAYNE PETERS

Appeal 2009-005445
Application 10/829,281
Technology Center 1700

Decided: April 29, 2010

Before BRADLEY R. GARRIS, ADRIENE LEPIANE HANLON, and CHARLES F. WARREN, *Administrative Patent Judges*.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from an Examiner's decision rejecting claims 1-3. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Claim 1, reproduced below, is representative of the subject matter on appeal.

> 1. An article for repairing turbine nozzle segments each having an airfoil between inner and outer platforms with a trailing edge portion of the airfoil removed leaving intermediate and leading edge portions of the airfoil between the platforms comprising:
>
> a trailing edge coupon having pressure and suction side wall portions;
>
> a plurality of film cooling holes generally radially spaced one from the other along a pressure side wall portion of the coupon;
>
> *said coupon including a trailing edge having a plurality of radially spaced openings connected to a radially extending plenum*;
>
> a plurality of radially spaced ribs extending between opposite pressure and suction sides of the coupon, said ribs shaped to form radially spaced flow channels for directing cooling air to said plenum; and
>
> wherein edges of the pressure and suction side wall portions are chamfered for welding to pressure and suction side wall portions of the intermediate portion of the airfoil.

Br., Claims Appendix (emphasis added).[1]

The following Examiner's rejections are before us on appeal:

(1) Claims 1-3 are rejected under 35 U.S.C. § 103(a) as unpatentable over the Appellants' disclosure of the prior art[2] in view of Williams,[3] Beeck,[4] and Field.[5]

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[1] Appeal Brief dated June 2, 2008.
[2] Paragraphs [0002]-[0004] of the Appellants' Specification.

(2) Claims 1-3 are rejected under 35 U.S.C. § 103(a) as unpatentable over the Appellants' disclosure of the prior art in view of Jackson 152,[6] Jackson 048,[7] or Mendham[8] and further in view of Williams, Beeck, and Field.

B. ISSUE

Have the Appellants identified reversible error in the Examiner's conclusion that the teachings of Beeck in combination with the prior art repair coupons described in the Appellants' Specification, Jackson 152, Jackson 048, or Mendham render obvious a coupon having a plurality of radially spaced openings connected to a radially extending plenum as recited in claim 1?

C. FINDINGS OF FACT

Beeck Figure 2*a*, reproduced below, illustrates a guide or turbine blade used in gas turbines. Beeck, paras. [0001], [0024].

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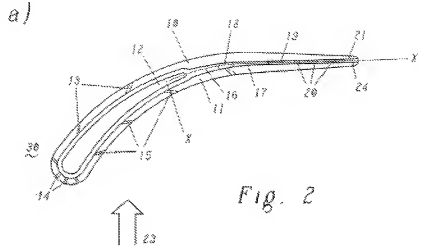
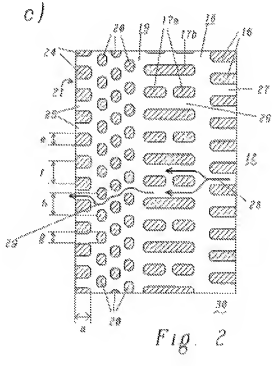
[3] US 2,657,902 to Williams issued November 3, 1953.
[4] US 2001/0012484 A1 to Beeck et al. published August 9, 2001.
[5] US 4,672,727 to Field issued June 16, 1987.
[6] US 2002/0197152 A1 to Jackson et al. published December 26, 2002.
[7] US 2003/0082048 A1 to Jackson et al. published May 1, 2003.
[8] US 5,269,057 to Mendham issued December 14, 1993.



Beeck Figure 2*a* depicts a cross section of the guide blade.

Beeck Figure 2*c*, reproduced below, is a section along line X-X in Beeck Figure 2*a*. Beeck, para. [0024].



Beeck Figure 2*c* depicts a portion of the guide blade illustrated in Beeck Figure 2*a*.

Beeck discloses:

> First ribs 16 are located directly adjacent to the insert 12. The cooling air flowing between insert 12 and the walls 10 and 11 flows essentially axially in the passages 27 between the ribs 16 into the rear region of the guide blade. Located behind the first row of ribs 16 is a front radial plenum 18, which permits a flow and pressure balance of the cooling air in the radial direction. Adjoining the plenum 18 is a further row of ribs 17 . . . .
>
> A further radial plenum 19 follows, followed by so-called pins 20, i.e. rows of ribs which are designed as simple webs and permit as uniform a distribution of the cooling-air flow as possible at the trailing edge 21. . . .

Beeck, para. [0025]-[0026]. Another row of ribs 24, located at the trailing edge, form passages 25 through which the cooling air flows. Beeck, para. [0027].

D. ANALYSIS

The Appellants only dispute in this appeal relates to Beeck. The Appellants argue that the exit passages 25 in Beeck do not connect to a radial plenum. Rather, the Appellants argue that "the cooling air must negotiate a series of offset pins 20 designed to uniformly distribute the flow of cooling air in an axial direction, i.e., in a direction toward the trailing edge." Br. 12.

The Examiner correctly explains that the trailing edge openings (e.g., 25) "are clearly 'connected' to the radial plenums of Beeck or no cooling medium would reach them." Ans. 10-11.[9] That is, the openings 25 are connected to the radial plenum 19 via the passages formed by pins 20. We note that claim 1 does not exclude intermediate passages, such as those

[9] Examiner's Answer dated August 20, 2008.

formed by pins 20, which connect the openings 25 with the radial plenums 18 and 19.

The Appellants also argue:

> . . . Beeck's disclosure is wholly unrelated to the design of repair coupons, and the Examiner has proffered no evidence or detailed rationale to support the conclusion that one skilled in the art would have incorporated the claimed cooling configuration into a repair coupon.

Br. 12.

This argument is not supported by the record. The Examiner found that it was known to construct nozzle airfoils with a plurality of cooling holes to extend the operating life of turbine nozzles. The Examiner also found that it was known to replace the damaged trailing edge portion of a nozzle airfoil with a replacement trailing edge portion, i.e., repair coupon. Ans. 3, 5. The Examiner concluded:

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate cooling hole improvements used in current extended life nozzle airfoils when repairing damaged nozzle airfoils in order to take advantage of the potential increase in operation life afforded by the inclusion of cooling holes.

Ans. 3-4; *see also* Ans. 8.

The Examiner also found that "using repair coupons having cooling holes is conventional in the art [as] shown by Jackson '048 (e.g. Figure 9), Jackson '152 (Figure 6) and Mendham (Figure 7)." Ans. 6.

Based on the foregoing, the Examiner concluded that it would have been obvious to one of ordinary skill in the art to use the rib and radial plenum configurations of Beeck in the aforementioned prior art repair coupons to improve cooling and increase operating life. Ans. 4-5, 6-7; *see*

also In re Thompson, 545 F.2d 1290, 1294 (CCPA 1976) (economic factors alone may provide sufficient motivation). Significantly, the Appellants do not direct us to any error in the Examiner's conclusions of obviousness or the underlying factual findings.

In sum, the Examiner's position is well supported by the record. Therefore, we will affirm the § 103(a) rejections on appeal.

D. DECISION

The decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

tc

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